WATER QUALITY GUIDELINES FOR NON-TARGET ANALYTES

October 2003

This spreadsheet calculates the concentations of non-target petroleum compounds in water which result in a hazard quotient of 1 based on ingestion &, for gasoline range, inhalation using the ingestion parameters used to set Federal and State Standards.

Non-Carcinogenic Risk Formula (EPA, December 1991):

Cw = [(THI*BW*AT*CF)/(ED*EF*((RAFw*IRw/RfDo)+(VF*IRa/RfDi)))]

C5-C8 ALIPHATICS	
Parameters	**Values**
Cw (Water concentration - µg/L)	367
THI (Target hazard index - unitless)	1
BW (Body weight - kg; (EPA, October 1996))	70
AT (Averaging time - day (EPA, December 1991))	25550
CF (Conversion factor - µg/mg)	1000
ED (Exposure duration - yr (EPA, October 1996))	70
EF (Exposure frequency - day/yr (EPA, October 1996))	365
RAFw (Chemical specific water relative absorption factor - unitless; MADEP, October 2002)	1
IRw (Ingestion rate - L/day; (EPA, October 1996))	2
RfDo (Oral reference dose - mg/kg/day (MADEP, May 2002))	0.06
VF (Volatilization factor - L/m^3 (EPA, December 1991)	0.5
IRa (Inhalation rate - m^3/day; TWA (EPA, August 1997)	18
RfDi (Inhalation reference dose - mg/kg/day (MADEP, May 2002))	0.057

C9-C12 ALIPHATICS	
Parameters	**Values**
Cw (Water concentration - µg/L)	386
THI (Target hazard index - unitless)	1
BW (Body weight - kg; (EPA, October 1996))	70
AT (Averaging time - day (EPA, December 1991))	25550
CF (Conversion factor - µg/mg)	1000
ED (Exposure duration - yr (EPA, October 1996))	70
EF (Exposure frequency - day/yr (EPA, October 1996))	365
RAFw (Chemical specific water relative absorption factor - unitless; MADEP, October 2002)	1
IRw (Ingestion rate - L/day; (EPA, October 1996))	2
RfDo (Oral reference dose - mg/kg/day (MADEP, May 2002))	0.10
VF (Volatilization factor - L/m^3 (EPA, December 1991))	0.5
IRa (Inhalation rate - m^3/day; TWA (EPA, August 1997)	18.4
RfDi (Inhalation reference dose - mg/kg/day (MADEP, May 2002))	0.057

C9-C10 AROMATICS	
Parameters	**Values**
Cw (Water concentration - µg/L)	46
THI (Target hazard index - unitless)	1
BW (Body weight - kg; (EPA, October 1996))	70
AT (Averaging time - day (EPA, December 1991))	25550
CF (Conversion factor - µg/mg)	1000
ED (Exposure duration - yr (EPA, October 1996))	70
EF (Exposure frequency - day/yr (EPA, October 1996))	365
RAFw (Chemical specific water relative absorption factor - unitless; MADEP, October 2002)	0.91
IRw (Ingestion rate - L/day; (EPA, October 1996))	2
RfDo (Oral reference dose - mg/kg/day (MADEP, May 2002))	0.03
VF (Volatilization factor - L/m^3 (EPA, December 1991))	0.5
IRa (Inhalation rate - m^3/day; TWA (EPA, August 1997)	18.4
RfDi (Inhalation reference dose - mg/kg/day (MADEP, May 2002))	0.0057

C9-C18 ALIPHATICS	
Parameters	**Values**
Cw (Water concentration - µg/L)	386
THI (Target hazard index - unitless)	1
BW (Body weight - kg; (EPA, October 1996))	70
AT (Averaging time - day (EPA, December 1991))	25550
CF (Conversion factor - µg/mg)	1000
ED (Exposure duration - yr (EPA, October 1996))	70
EF (Exposure frequency - day/yr (EPA, October 1996))	365
RAFw (Chemical specific water relative absorption factor - unitless; MADEP, October 2002)	1
IRw (Ingestion rate - L/day; (EPA, October 1996))	2
RfDo (Oral reference dose - mg/kg/day (MADEP, May 2002))	0.10
VF (Volatilization factor - L/m^3 (EPA, December 1991))	0.5
IRa (Inhalation rate - m^3/day; TWA (EPA, August 1997)	18.4
RfDi (Inhalation reference dose - mg/kg/day (MADEP, May 2002))	0.057

C19-C36 ALIPHATICS	
Parameters	**Values**
Cw (Water concentration - µg/L)	~~70,000~~
Beneficial use ceiling (µg/L)	1,000
THI (Target hazard index - unitless)	1
BW (Body weight - kg; (EPA, October 1996))	70
AT (Averaging time - day (EPA, December 1991))	25550
CF (Conversion factor - µg/mg)	1000
ED (Exposure duration - yr (EPA, October 1996))	70
EF (Exposure frequency - day/yr (EPA, October 1996))	365
RAFw (Chemical specific water relative absorption factor - unitless; MADEP, October 2002)	1
IRw (Ingestion rate - L/day; (EPA, October 1996))	2
RfDo (Oral reference dose - mg/kg/day (MADEP, May 2002))	2.00

C11-C22 AROMATICS	
Parameters	**Values**
Cw (Water concentration - µg/L)	~~46~~
Achievable detection limit (µg/L)	300
THI (Target hazard index - unitless)	1
BW (Body weight - kg; (EPA, October 1996))	70
AT (Averaging time - day (EPA, December 1991))	25550
CF (Conversion factor - µg/mg)	1000
ED (Exposure duration - yr (EPA, October 1996))	70
EF (Exposure frequency - day/yr (EPA, October 1996))	365
RAFw (Chemical specific water relative absorption factor - unitless; MADEP, May 2002)	0.91
IRw (Ingestion rate - L/day; (EPA, October 1996))	2
RfDo (Oral reference dose - mg/kg/day (MADEP, October 2002))	0.03
VF (Volatilization factor - L/m^3 (EPA, December 1991))	0.5
IRa (Inhalation rate - m^3/day; TWA (EPA, August 1997)	18.4
RfDi (Inhalation reference dose - mg/kg/day (MADEP, October 2002))	0.0057

EPA, December 1991; Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part B)
EPA, October 1996; Drinking Water Regulations and Health Advisories
EPA, August 1997; Exposure Factors Handbook Volumes I & III
MADEP, October 2002; Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach
MADEP, May 2002; Updated Petroleum Hydrocarbon Fraction Toxicity Values for the VPH/EPH Methodology